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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,309	02/17/2004	Shao-An Cheng	V9661.0054	9754

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EXAMINER
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SMITH, NICHOLAS A

ART UNIT	PAPER NUMBER
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1753

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07/27/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/780,309	CHENG ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Nicholas A. Smith	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-13, 21-23 and 27-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 21-23 and 27-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### **Status of Claims**

1. Claims 1-13, 21-23 and 27-35 remain for examination. Claim 36 is new.

### ***Response to Arguments***

2. Applicant's arguments, see remarks, filed 15 June 2007, with respect to the rejection(s) of claim(s) 1-13, 21-23 and 27-35 under Fitzmaurice et al. have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Boschloo et al. (Spectroelectrochemistry of Highly Doped Nanostructured Tin Dioxide Electrodes, *J. Phys. Chem. B* 1999, vol. 103, 3093-3098) along with evidence from Nath (US 4,605,565). In regards to Applicant's argument that Kinoshita et al. and Boschloo et al. are not capable of ozone generation, please see reasons stated below in paragraphs 14 and 18. In regards to Applicant's argument that the presence of conductive, fine, carbon powder would facilitate oxygen evolution and prevent ozone generation, this statement is merely an unsupported conclusion. Applicant should provide evidence towards such a conclusion.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1-4, 21-23, 27-33 and 35-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant should use language

of either "atomic %" or "weight %" to describe Antimony and Tin ratios. It is assumed for the purpose of examination that Applicant means "atomic %" as stated in claim 9.

Furthermore, claim 35 specifies a Sn to Sb atomic ratio that does not fall within the independent claim 1's range of Sn to Sb ratio. Therefore, it is assumed that "of about 62.5:1" is meant be read as "of about 6.25:1" (a value falling within the claimed range of independent claim 1) for the purpose of examination.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated over Boschloo et al. as evidenced by Nath.

7. Boschloo et al. discloses a 5-nm diameter Sb-doped SnO<sub>2</sub> nanocrystals connected as a film on a substrate (p. 3093). Wherein Boschloo et al. does not specify the Sb:Sn ratio as claimed, Boschloo et al. discloses such tin dioxide doped with antimony is a well-known conductor in solar cell applications. Nath evidences that such tin dioxide doped with antimony is a well-known conductor in solar cell applications have the claimed Sn to Sb ratio (Nath, Example 3).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boschloo et al. in view of Kotz et al. (US Patent 4,839,007).

10. Boschloo et al. does not specifically disclose the substrate as claimed.

11. Kotz et al. discloses the substrate material as claimed (col. 3, lines 47-64). It would have been obvious to one of ordinary skill in the art to modify Boschloo et al.'s substrate with Kotz et al.'s substrate because Kotz et al. teaches titanium can operate as a long term electrode using this material (Kotz et al., col. 1, lines 46-53).

Furthermore, spot-welding with same material as the substrate would be commonly done in order to establish an electrical connection.

12. Claims 5-6, 8-10, 21, 34 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boschloo et al. as evidenced by Nath and Koizumi et al. (US 2004/0011665).

13. In regards to claim(s) 5, Boschloo et al. as evidenced by Nath is applied to the claims for the same reasons as stated in paragraph(s) 7 above.

14. In regards to claims 21 and 36 and amended feature of claim 5 "and wherein the electrode member is capable of generating ozone," while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). See MPEP

2114. Boschloo et al. discloses an electrode member that is substantially the same as

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the instantly claimed electrode member and therefore would be capable of the instant claimed ozone generation as evidenced by Koizumi et al. (Koizumi et al., paragraph [0005] and paragraph [0029]). In regards the claimed feature "for electrochemical generation of ozone," applicant is reminded that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). See MPEP 2114.

15. In regards to claim(s) 6 and 8-10 and 34, please see paragraph 7 above.

16. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinoshita et al. (US Patent 5,446,339).

17. Kinoshita et al. is applied to the claims for the same reasons as stated in paragraph(s) 12 of the previous office action.

18. In regards to amended feature of claim 5 "and wherein the electrode member is capable of generating ozone," while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). See MPEP 2114. Kinoshita et al. discloses an electrode member that is substantially the same as the instantly claimed electrode member and therefore would be capable of the instant claimed ozone generation.

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19. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boschloo et al. as evidenced by Nath and Koizumi et al. in regards to claim 5 as stated above in paragraph 7, and in view of Alder (US Patent 3,960,678).

20. In regards to claim 11-13, Boschloo et al. does not disclose a coating member comprising Nickel.

21. Alder teaches the use of Ni and Sb in SnO<sub>2</sub> electrodes. It would have been obvious to one of ordinary skill in the art to modify Boschloo et al.'s electrode with Alder's dopants in order to improve sinterability, compactness and conductivity (Alder, col. 3, lines 57-61). Alder teaches a range of Ni and Sb that overlap the claimed ranges of dopants and such overlap establishes a prima facie case of obviousness as Alder teaches such addition of dopants have same utility over the whole range (col. 3, lines 57-61). See MPEP 2144.05.

22. Claims 22-23, 27 and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boschloo et al. in view of Kotz et al. and as evidenced by Nath, Koizumi et al. and Murphy et al. (US 5,972,196).

23. In regards to claim(s) 22-23, Boschloo et al. does not specifically disclose an electrochemical system.

24. Kotz et al. discloses an electrochemical system for an Sb-modified SnO<sub>2</sub> electrode (col. 3, lines 47-64). It would have been obvious to one of ordinary skill in the art to modify Boschloo et al.'s electrode with Kotz et al.'s electrochemical system in order to electrochemically treat aqueous fluids (Kotz et al., col. 2, lines 24-29).

25. Boschloo et al. in view of Kotz et al. does not specifically disclose a solid polymer electrolyte such as a sulfonated tetrafluorethylene copolymer. However, Murphy et al. evidences that ozone generation systems typically have a sulfonated tetrafluorethylene copolymer (col. 20, line 57 to col. 21, line 28).

26. In regards to claim(s) 27, Murphy et al. evidences the use of the claimed electrolytes in an ozone generation system (col. 21, lines 41-44).

27. In regards to claim(s) 29-32, Murphy et al. evidences the use of the claimed constant voltages (col. 3, lines 42-62) and thus a case of prima facie obviousness is established. See MPEP 2144.05. It would have been obvious to one of ordinary skill in the art to select the claimed voltage from the broader prior range because Murphy et al. teaches the same utility over the whole range (Murphy et al., col. 3, lines 42-62).

28. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boschloo et al. in view of Kotz et al. and as evidenced by Nath, Koizumi et al. and Murphy et al. (US 5,972,196), and further in view of McGuire (US Patent 6,368,472).

29. Boschloo et al. in view of Kotz et al. does not specifically disclose the claimed electrolyte concentration.

30. McGuire discloses the concentration as a results effective variable (col. 11, lines 19-29). It would have been obvious to one of ordinary skill in the art to optimize Boschloo et al. in view of Kotz et al.'s electrolyte concentration because McGuire teaches that electrolyte concentration is a result-effective variable that can optimize the amount of ozone generated (McGuire, col. 11, lines 19-29).



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31. Claims 33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boschloo et al. in view of Kotz et al. and as evidenced by Nath, Koizumi et al., Murphy et al. and Zen et al. (US Patent 5,855,760).

32. In regards to claim(s) 33, Boschloo et al. in view of Kotz et al. does not specifically disclose an Ag/AgCl reference electrode, but only a calomel electrode (Kotz et al., col. 3, lines 29-31). Zen et al. evidences that is commonly known in the electrochemical art to also use Ag/AgCl reference electrodes in place of calomel electrodes (Zen et al., col. 4, lines 1-9).

33. In regards to claim(s) 35, see paragraph 7 above.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas A. Smith whose telephone number is (571)-272-8760. The examiner can normally be reached on 8:30 AM to 5:00 PM, Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on (571)-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NAS



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PRIMARY EXAMINER